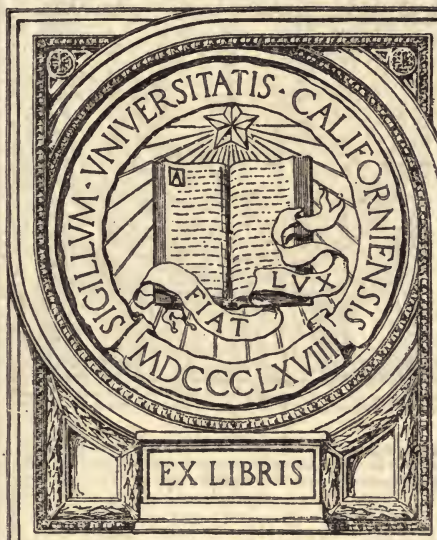
LB
5
C8
v.2:2

UC-NRLF
B 3 023 561

GIFT OF
MICHAEL REESE



PAT. JAN. 21, 1908

MONOGRAPHS

OF THE

INDUSTRIAL EDUCATION ASSOCIATION

SIX NUMBERS A YEAR PRICE, $1.00 A YEAR.

VOL. II. No. 2. { Entered at the Post Office at New York City as second class matter. } WHOLE No. 8.

MANUAL TRAINING

IN

ELEMENTARY SCHOOLS FOR BOYS

BY

A. SLUYS,

Director of the Normal School, Brussels, Belgium.

PART II

EDITED BY
NICHOLAS MURRAY BUTLER, Ph.D.,
President of the Industrial Education Association.

NEW YORK.
INDUSTRIAL EDUCATION ASSOCIATION.
MARCH, 1889.
Twenty Cents.

EDUCATIONAL MONOGRAPHS

Published under the auspices of the INDUSTRIAL EDUCATION ASSOCIATION, of New York, and written by the foremost Educators and Public School Workers, both in this country and abroad, furnishes a series of papers to teachers on the Educational Questions of the Day. The papers are concise, clear and comprehensive, especial prominence being given to the Manual Training Movement.

Six Monographs will appear each year, and the subscription price will be fixed at the extremely low price of $1.00 per annum.

The following have appeared:

I. **A Plea for the Training of the Hand**, by D. C. GILMAN, LL.D., President of Johns Hopkins University.—**Manual Training and the Public School**, by H. H. BELFIELD, Ph.D., Director of the Chicago Manual Training School. 24 pp.

"For the student or teacher who is making a study of manual training this first number of the Educational Monograph Series is the best possible introduction to the subject."—*Science.*

II. **Education in Bavaria**, by SIR PHILIP MAGNUS, Director of the City and Guilds of London Institute.

III. **Physical and Industrial Training of Criminals**, by DR. H. D. WEY, of State Reformatory, Elmira, N. Y.

IV. **Mark Hopkins, Teacher**, by PROF. LEVERETT W. SPRING, of Williams College.

V. **Historical Aspects of Education**, by OSCAR BROWNING, M. A., of King's College, Cambridge.

VI. **The Slöjd in the Service of the School**, by DR. OTTO SALOMON, Director of the Normal School at Nääs, Sweden.

VII.–VIII. **Manual Training in Elementary Schools for Boys**, by PROF. A. SLUYS, of the Normal School, Brussels.

The following are nearly ready:

The Teaching of History, by DR. EDWARD CHANNING, of Harvard University.

Objections to Manual Training, by COL. FRANCIS W. PARKER, of Cook Co. (Ill.), Normal School.

Extent of the Manual Training Field, by PROF. C. M. WOODWARD, of Washington University, St. Louis.

Graphic Methods in Teaching, by CHARLES BARNARD, ESQ., of Chautauqua T. C. C.

Elementary Science in Schools, by PROF. W. LANT CARPENTER, of London.

The Jewish Theory of Education, by PROF. HENRY M. LEIPZIGER, Director of the Hebrew Technical Institute.

Domestic Science in the Schools, by MRS. EMMA P. EWING, of Purdue University.

The Science of Cooking as a Factor in Public Education, by MRS. ELLEN H. RICHARDS, of Mass. Institute of Technology.

Monographs will also be written by PROF. FRIEDRICH PAULSEN, of the University of Berlin; Dr. E. HANNAK, of Vienna; PROF. A. SALICIS, of Paris; PRESIDENT W. P. JOHNSTON, of Tulane University; SUPERINTENDENT JAMES MACALISTER, of Philadelphia; SUPERINTENDENT JOHN E. BRADLEY, of Minneapolis, and others.

Leaflets are also issued from time to time, giving information on specific educational topics. The Leaflets are sold for 1 cent each, or sent by mail on receipt of a 2-cent stamp. Superintendents and others ordering a quantity are offered a liberal discount.

The payment of **50 cents** will entitle any person to receive **all the Leaflets** that may be issued for **one year.** They will be sent by mail promptly as issued.

For Monographs or Leaflets, address, enclosing postal note or money order, payable to the Industrial Education Association. One and two-cent stamps may also be sent.

Registrar of the College for the Training of Teachers.

9 University Place, New York City.

MONOGRAPHS

OF THE

INDUSTRIAL EDUCATION ASSOCIATION

SIX NUMBERS A YEAR. PRICE, $1.00 A YEAR.

VOL. II. No. 2. { Entered at the Post Office at New York City as second class matter. } WHOLE No. 8.

MANUAL TRAINING

IN

ELEMENTARY SCHOOLS FOR BOYS

BY

A. SLUYS,

Director of the Normal School, Brussels, Belgium.

PART II

EDITED BY

NICHOLAS MURRAY BUTLER, Ph.D.,

President of the Industrial Education Association.

NEW YORK.

INDUSTRIAL EDUCATION ASSOCIATION.

MARCH, 1889.

Twenty Cents.

LB5
C8
v.1:2

Copyright, 1889,
BY
Industrial Education Association.

UNIVERSITY OF CALIFORNIA

Manual Training in Elementary Schools for Boys.

V.

THE METHOD OF NÄÄS.

If we call that *method* which is a rational and systematic progress towards a well-defined object, manual training in the school at Nääs constitutes a method indeed, and one that possesses an unquestionable claim to originality. Nothing in this system is left to chance. It is the result of experiments covering many years, with the constant desire of giving practical form and efficiency to primary instruction in manual work. M. Salomon is in favor of the modern conception of the common school, and has endeavored to be faithful to the fundamental principles of the science of education concerning which there has been little ground of difference since Montaigne, Coménius, Rousseau, Pestalozzi and Froebel. We will give a résumé of his lectures on the principal question which this broad theme has opened.

I.—The Necessity and the Aim of Manual Training in the Primary School.

We know by experience that a child has a natural tendency to activity. It manifests it from the time it begins to be able to use its members ; it likes to exercise its feeble efforts upon every object it can grasp ; it takes such as are

brought to it, or are near to it, and handles them, throws them and breaks them, not in a spirit of destructiveness, but from pure necessity of action ; and because of the impulse of that instinctive curiosity which is the ultimate starting point for every mental acquisition. The educator is to join forces with this tendency, and direct the child's development. The actual programme of primary instruction has never taken this sufficiently into account. The lessons are almost all of a theoretical character, and appeal to the mind only. The hand, that admirable instrument, designed to give to thought its concrete form, has not been the object of special training in the primary school. Writing and drawing are the only branches which have called for its aid ; but these can only develop it incompletely ; and they do not give to it the general aptitude which finds its application in the exercise of every vocation, of all the arts, and in the various exigencies of practical life. Gymnastics proper can no longer be regarded as sufficient for the purpose ; they strengthen the muscles, but do not increase manual dexterity. That child's education is imperfect which has only taught it to think, or has only furnished its mind with ideas. It must develop all its faculties, including manual dexterity. It is not essential to give to a child an exclusively literary or scientific training, but it is essential to fit him for the arts, trades and industries, that is to initiate him in all the forms of human enterprise. General manual dexterity can only be developed in work that requires systematic handling of numerous tools. The question of teaching trades in the public schools can never be raised ; this would diverge widely from the true object, which is the integral and harmonious cultivation of the faculties. On the same grounds that arithmetic, geometric forms, writing, drawing, etc., are not specially or solely intended as preparation for the professions of engineers, officers of the State, or artists, manual training does not make it necessary that its pupils should become turners,

joiners and blacksmiths. It is objected that there is already enough work in the primary schools. This is true of mental work, but it is certain that there is included no serious manual work.

Besides, manual training differs essentially from intellectual work; the latter has a very great value, but the pupil acquires it from necessity, and does not feel its worth. He lacks generally the motive of a love of study, and also a conception of the object to be gained, and, losing sight of this aim, he studies mainly because he is compelled to. On the other hand, manual training attracts and pleases the child because it here finds food for the imperious need of activity which inheres in the nature of its being; it also sees in it the result of its efforts, and can appreciate and enjoy them. Likewise when a young boy learns to conjugate a verb, or solve a problem, he does not consider the utility of his effort; but if he constructs a bench, or a box, he has clearly before his mind the object to be gained, and can compare his work with the model, with an appreciative sense of its being well or ill done. Hence we observe that pupils are much more pleased with the training in the work-shop than with that of the class-room. It is on these grounds that we may safely affirm that manual training has greater educational value than that which is purely intellectual. It inspires in a high degree a taste for work and a love of wholesome occupation. Manual training has another result which it is equally important to observe. It shows constantly to the pupil that material work has a very great and peculiar value; it inspires in him a respect for labor and discourages the contempt in which it is too generally held by the children of the poorer class. The pedagogic system of instruction in manual training in the primary schools, suppresses one of the causes of the desertion of trades by the children of workmen and peasants. It shortens considerably the period of apprenticeship; for the boy, who during several years has been exercised in manual

work at school, acquires much more rapidly all the practical secrets of any trade. But manual training is essential for all pupils, even those who are not to follow a trade. Not to develop manual dexterity is to deprive children of an aptitude that is of great importance in all practical life, and a source of wholesome diversion ; it is to act with as little discernment as though one were to cultivate the memory alone and neglect every other intellectual faculty. The child who has had the discipline of the work-shop acquires habits of order and precision. His desire, as all experience proves, is to construct the object in the best manner, and this desire increases with acquired skill. Comparing his work with his model, he calculates the progress that he makes, and gradually corrects his own errors. These two habits, thus formed, influence all his other school work. Every instructor knows that attention is the indispensable condition of successful study ; the mind, if distracted, gains nothing. Without attention there are no ideas, no reflection, no development of the mind. Mechanical work compels attention which thus becomes habitual. There are trades which require constant concentration of the mind upon the work, and which fix the habit of attention. Working with the substance gives, moreover, more clear perception of form and dimensions ; it is intuitive in the highest degree. Well-directed manual occupations sharpen the sense of vision, develop the faculties of attention, intuition and reflection, and exercise the mind in their combination. When the choice of models is made wisely it awakens in the pupil the æsthetic sense, and prevents its being corrupted ; it teaches how to give to matter a correct form and one properly related to the purpose for which the object is designed. In ordinary lessons pupils remain at their desks many hours. This sitting position is bad ; it enfeebles the body, and in this way reacts upon the mind. Gymnastic exercise in schools has its reason for being, in the need of preserving the organic equilibrium. It increases

the functional energy, and, through this, the moral. Manual occupations produce similar effects, if they are so chosen as to require the pupil to stand at his work and exercise vigorously. We have often heard a wish expressed in Sweden that manual training might be introduced into the schools of intermediate and higher grades to counteract the effect upon the student of too close mental work [15].

It is alarming when we consider the disastrous consequences which often result from application to the prescribed course of study for those who are to adopt liberal professions. During twenty years of their life they exhaust their nervous and muscular force by intense intellectual efforts. "A tendency to mental aberration, to softening of the brain, and to nervous disease, is the growing result of special exclusive studies," says M. Leneveux.[16] And he recommends manual work as an excellent means of promoting the regular functions of the physical organism for those who do not belong to the class of manual workers. Such are the important general considerations which together characterize the work of manual training from the pedagogic point of view. We sum them up in saying that its object is :

(1) That the child may acquire general manual dexterity. (2) To awaken in him the habit and love of work. (3) To promote spontaneity and originality. (4) To convince him that order and correctness are essential elements of progress. (5) To develop the faculties of attention and perception. (6) To make the child earnest and persevering. (7) To waken the æsthetic feeling without allowing it to become perverted or exaggerated. (8) To neutralize the baneful influence of intellectual studies and the sedentary position maintained in study hours, upon the general organism.

---

15 In some intermediate and higher grades of schools in Sweden manual training has already been introduced.

16 *Le Travail Manuel.*

II.—Choice of Manual Occupations.

The choice of manual work to be made use of in primary schools in order to confer the most complete educational benefit, such as we have endeavored to explain, is no trivial affair. It must include many conditions bearing upon the general question—conditions rarely found united in many of the trades. Rousseau lays great stress upon this point in *Emile*, in some considerations which we shall take pains to bring forward because of their essential bearing upon results.

He rejects from the outset "every sedentary and household occupation which effeminates and weakens the body." Occupations of this kind neither attract nor suit children. What is true for *Emile*, who is trained for high life, and never "fastened to his books," is for strong reasons true for our children, whom the necessities of public instruction compel to remain seated for hours at a desk. We must then first eliminate certain trades—for instance, that of the tailor—which cannot develop the general energy of the body.

Then, he says: "I forbid for my pupil all unwholesome trades." It is useless to dwell upon this point. Bakery and many others enter into this list.

Moreover, we must consider appropriateness. "I would not make of your son a joiner, or a blacksmith; I would not like to see him at the forge in the character of a Cyclops; neither would I make of him a mason, still less a shoemaker. All trades must be practiced, but whoever can choose should have regard to neatness, for this is not a matter of opinion, but one which feeling must decide." Almost all children have too great a propensity to neglect the demands of neatness, and to soil themselves with deliberate purpose. Education should tend to overcome this propensity, for neatness is not only essential from the hygienic point of view—it is almost a virtue, and acts strongly upon the morals. When we see children neg-

lected, unwashed, unkempt, and with clothing soiled and torn, we may be sure that in the family and the school the spirit of order does not exist, and that neglect of duty is the rule.

"I should not like those stupid trades where the men listlessly and automatically employ their hands at the same round of work, such as weavers and stone-cutters; of what service are such occupations to men of mind? It is one machine grinding another." Trades of this sort are not suited to primary schools; they call for little manual skill, and deaden the intelligence rather than stimulate it. We must exclude all professions which demand only restrained movement, which incline to be automatic, and especially those in which the work being done by machinery the duty of the workman is simply to put the material in place, and withdraw it when it is transformed; for such work has no sort of educational value; it does not hold attention nor reflection to the task, nor procure any satisfaction to the child, who is reduced by it to a mere mechanical over-sight."

The *division of work*, which is carried to an extreme in modern industry, has crowded the professions in which the workman is no longer a veritable artisan transforming the primary substance into works complete of themselves, and bearing the stamp of his individuality. It is true that this principle of the division of labor is excellent from the economical point, since it produces at a cheap rate a great many useful objects. But it is false to pretend that the extreme division of labor is favorable to intellectual growth in the workman, because of its leaving him free to think of other things during the time that his hands engage in simple movements; too simple, always the same, and never demanding of him that he should think about them.

In reality, machine work promotes stupidity, and transforms the workman himself into a machine unless he be exceptionally endowed. The child, as we have already

remarked, can find satisfaction only in such work as clearly reveals to him its purpose and value. To direct him to construct an object which is to pass through the hands of several others in order to be finished, is invariably to create in him a disgust for the work. Under such conditions the responsibility is divided ; of what importance is it to the pupil that the work be well done ? It is going to be taken by another, who will do with it as he wishes ; as for him, he ends his task, be it good or bad ; what direct interest has he in doing it in the best manner possible ? If the finished object is defective, he is little concerned about it ; it is not his work. At school it is essential to impose upon the child the task of giving to raw material a definite form, in which no other person has assisted, that he may lay personal claim to it as his work, and one for which he is entirely responsible. The trade to be chosen must, then, be such as demands no division of labor, and this considerably limits the choice.

It is sufficient to point briefly to the necessity of giving to children only such occupations as are in proportion to their physical strength. If they demand too violent or fatiguing effort, they debilitate and exhaust them ; but if they are too easy and excite no sustained attention, or do not present ever increasing difficulties of execution, they do not exercise the faculties sufficiently, do not promote bodily health, and will not form habits of persevering effort.

On the other hand, the exercises should consist of an *inductive series*, gradually increasing in difficulty of execution, exciting energy, demanding more and more attention, so that each effort may be a little more difficult than that which preceded it, and so prepare for the work which is to follow. This is the necessary condition for cultivating emulation, zeal and perseverance, and insuring constant progress on the part of the pupil.

The nature of the objects to be manufactured by the

children is also important. It touches considerations of a high order, which at first sight do not appear, and in connection with which we are about to make some suggestions. At Nääs, every work of luxury, of pure fancy, or for mere ornament, is prohibited; the method only includes the construction of useful objects which can be employed in the families of the children attending the school.

Their nature is determined by the social position of the parents of the pupils; they belong generally to the farming or working class, as do the great majority of those in other places who go to the public schools. Such an object, while useful in the home of a rich citizen, would be out of place in the humble lodging of a workman or peasant. For these last everything was a luxury which has no direct value in the housekeeping. But we have in view the education of the children of the most numerous social class, that which lives by manual labor. It is in the highest degree important not to cultivate in them a taste for frivolities and useless things. The time they spend at school is too short, the practical necessities of life too imperious, for us to rationally think of teaching them to construct objects of mere ornament. Besides, this question has a moral aspect which should engage our attention. Experience proves that children who have been altogether taught construction of objects of luxury feel afterwards a strong dislike for making useful and indispensable ones. Hence young girls who have begun with embroidery and work of that description, will be more disinclined to engage in the housekeeping cares, mending of garments, making of shirts and everything which they consider unworthy their attention. In the same way most boys after being assigned to the making of objects of ornament, such as boxes, frames and other things of questionable choice, cut from wood and card-board, show a disdain for more serious work. There are formed in their minds, unconsciously, false notions concerning the object and the dignity of work; they come to

look upon heavier tasks as unworthy of their efforts and distinct from what they consider noble work, whereas it is desirable to penetrate their minds at the earliest possible period with this profound moral principle, that all useful work confers honor upon those who do it. We insist upon the importance of this principle, because in highly civilized countries many children of workmen and peasants show a strong tendency to despise manual labor, aspire to abandon the condition of their parents and to embrace professions that they consider much superior, such as clerkships in mercantile houses or public offices.

In organizing manual training in a school for the people, and in excluding from it wholly such occupations as have no other object but luxury or ornament, we shall inspire the children with a respect and liking for the useful occupations followed by their parents. We think that the principle laid down in the above should also be applied to schools frequented by those in easy circumstances. They have already too much inclination in these modern times to occupy their attention with futile objects, and to attach to them a merit that they by no means deserve. In having them perform useful work we may counteract, in a certain degree the bad effects of an ill-directed home-education. We are asked if it is not proper to teach children to make toys. This kind of work has been condemned at Nääs for many reasons. First, the instruction given in Slöjd is to children from ten to fifteen, sons of peasants or working-men; they have a life before them for which they must be prepared; the making of things so trivial and transient as toys is not consistent with such an object. Then, too, toys at this age only give a brief satisfaction. Children find no more pleasure in making them than in the useful articles to be given to their parents, and which serve useful purposes in their homes. Parents do not value the toys, while they do prize the useful articles. When the child brings from school an object of this kind,

they show satisfaction and congratulate and encourage the little worker. The object is at once utilized, and they make use of it with a pleasure that is ever new. The toy falls short of that general satisfaction which is to the child a lively stimulant. At first, in the Nääs school, they did cause the children to construct mere objects of ornament, and toys; but the parents showed themselves quite averse to this kind of work; they said it was to their children a loss of precious time; it became necessary to pay them fifty-six centimes a day to engage them to send their children to the Slöjd. After this experience, objects having no practical utility were entirely suppressed, and from that time the parents have taken pleasure in seeing their children pursuing the course of manual training.

At the Teachers' Convention held at Upsal in 1883, this subject was under discussion, and the views of M. Salomon concerning the nature of objects in the course of the Slöjd was almost unanimously approved. Hence we may affirm that the Slöjd is thus deeply rooted in Swedish soil because of its utilitarian character, and has been for this reason commended to the mass of people; while its principles are in strict conformity with those of a serious education. Here, then, Rousseau was right: "I wish above all that Émile should learn a trade. A reputable trade at least, do you say? What does the word mean? Is not every trade that is useful to the public, respectable? I do not wish him to be an embroiderer, a gilder or varnisher like the gentleman of Locke, I prefer that he should build highways rather than make flowers on porcelain. So returning to the first expression, let us choose a respectable trade, but let us ever remember that there is no respectability without utility."[17]

In manual work the construction of objects should tend to develop the æsthetic feeling by their pure forms. This theory is not in contradiction to those which prohibit

17 Rousseau, Emile, Book III.

objects of mere ornament or luxury. Useful household objects are capable of a certain degree of good taste when constructed exactly, correctly, and with neatness. It is not in superfluous ornament that we find true beauty. It has been said with reason that "the beautiful is the splendor of the true." Ornamentation in excess shows the decadence of art. One may safely assert this in regard to many modern conceptions, artistic so called, such as monuments, marbles etc. We must guard against this carefully in primary education in general, and particularly in manual training. True beauty consists in that harmony and symmetry, which provides that everything be perfectly adapted to its use, that it occupy exactly the necessary space, so that there be none too much or too little, all parts being balanced and sustained by unity. Every useful object, however common it may be, may illustrate by its structure, either vulgarity or good taste. So in the composition of a series of models, we should consider first of all their utility from the point of view of the social condition of the pupil, but give to them always the most elegant form possible. In this way the Slöjd may have a truly educating influence. Not only will it develop the skill of the hand, but the exactness of the eye, and it will gratify the sense of the beautiful while it will prevent it from misleading, corrupting, or predominating too exclusively.

Such are the principles which have guided M. Otto Salomon in the choice of trades to be introduced into the primary school. We make a complete review of them when we say that the manual occupations of the primary school are to answer the following conditions :

1st. To exercise as completely as possible manual skill.

2nd. To fix the attention and awaken the intelligence.

3rd. To give habits of order, exactness and neatness.

4th. To limit the construction of objects to those of general utility.

5th. To develop the æsthetic feeling without exaggerating or perverting it.

6th. To undertake the construction of complete objects, to be finished without division of labor.

7th. The work to be in proportion to the physical strength of the children.

8th. To be wholesome, to develop general strength and to be carried on as far as possible in the standing position.

9th. To present a progressive series, that is, graduated according to the difficulties of execution.

In schools of primary manual work, the choice of the means has generally been limited to the following:

Work in iron at the forge—locksmithing.

In straw and rushes—basket-making.

In paper, card-board—book-binding.

In wood—turning, carving, carpentering and coopers' work.

The following table indicates succinctly, for each one of these means, which of the conditions above mentioned, it fulfills:

	General Manual Skill.	Attention Intelligence.	Order Correctness.	Neatness.	General Utility.	Æsthetic Feeling.	No Division of Work.	Develops General Strength.	Adapted to Phys. Strength of Child.	Progressive Series.
Work in Iron.....	No	‡	‡	No	Lim'd	Little	No	Yes	No	?
Basket-making.....	No	Yes	Yes	Yes	Yes	Yes	No	No	Incomplete.	Yes
Book-binding.....	No	Yes	Yes	Yes	Lim'd	Yes	Yes	No	No	Lim'd
Card-board Work.....	No	Yes	Yes	Yes	Lim'd	Yes	Yes	No	No	Yes
Work in Wood.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wood Carving.....	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Wood Turning.....	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Observations on the Table.

1. Work in Iron.—The labor with the hammer and saw increases the vigor of the arm, but does not exercise the hand in any variety of directions; it rather dulls it. The

apprenticeship is hard and long ; the intelligence is only roused with him who already knows the trade well ; the beginner works without requiring its being called into action ; work with the saw is too mechanical ; the smith's hammer is too heavy for a child to handle ; objects which can be made by pupils from 10 to 14 years, are rarely of immediate use in the household ; forms are too slightly varied to cultivate the sense of the beautiful.

2. Basket-making.—The fingers only are efficiently trained, the scant supply of tools forbids variety of movement ; children cannot complete a basket from the beginning ; the rim is too difficult of construction ; the teacher is obliged to intervene and finish the child's work ; large baskets demand efforts that children cannot make ; the work is done in a sitting position and does not develop the general bodily vigor.

3. Book-binding.—The general and direct value of this trade, in relation to the child and his family, is very limited ; children are rarely able to bind a book correctly ; at Gothembourg it was said that only 3 per cent. of 66 pupils succeeded in producing satisfactory results. A progressive series of book-binding is possible, but it is very limited.

4. Card-board work.—This work answers to all sorts of conditions, but is scarcely favorable to the development of health ; it has slight application to practical purposes ; it promotes the skill of the fingers only and not of the hand in general.

5. Work in wood is more favorable. Rousseau well understood this : "All considered," he says, "the trade I should prefer my child to choose, would be that of the joiner. It is neat, it is useful, it can be practised in the home, it keeps the body in tolerably good condition ; it exacts skill and readiness from the workman, and in that kind of work in favor of which usefulness decides, while elegance and taste are not excluded." It is to this conclu-

sion that they have come at Nääs. The Slöjd there includes the making of a hundred objects of wood. It is not joiner's work, properly speaking: it is a combination of carpentering, cooperage, turning and carving. There are 46 tools. The list will be found with appendix. (See p. 50.) They comprise the usual joiner's tools, besides the knife, the *wabstringue*, a curved knife, which is used to carve spoons; the chisels and gouges of a turner, and the turning lathe. The knife, which is unknown to joiner's work properly so-called, is very much used in the Slöjd. The Swedish peasants use it to carve a multitude of objects in wood and their children are long accustomed to the use of this instrument, before entering school. They profit by this preliminary acquisition, as the knife is often used in the manufacture of the objects in the series. Carving and turner's work however, occupy but a limited place in this method; they do not answer the requisite conditions. Carving is done in a sitting position, and exacts slight movement of the hand. The time is, moreover, too short to give any number of special exercises in carving. Yet there is a sufficient quantity of it done to give to a few objects a certain artistic value by a very simple ornamentation. The turner's work is always difficult and not without danger; besides it calls for a one-sided effort; we cannot therefore give to it a prominent place in school-work. In a word, wood-work, without carving or turning, is sufficient, to attain the general result sought. Taken together, the exercises of the Slöjd give opportunity for the handling of all the tools employed in wood-work, and for all the necessary manipulations peculiar to work of this class. When they have executed the hundred models, we may say that the pedagogical object of the work is attained; they have acquired the general manual dexterity which finds such frequent application in practical life, and whatever manual occupation they may choose, their apprenticeship in it will be more rapid and they are prepared for

the successful practice of many trades. The objects made by the pupils are neither polished nor colored. Experience proves that children from 10 to 15 years of age do not generally succeed well in applying color or polish to wood. Another more important reason militates in favor of prohibiting this. The child has a natural propensity to conceal the defects of his work, and he may succeed by the application of this paint or polish in giving a presentable outside appearance to an object whose merit is doubtful. He thus acquires the habit of not doing his work conscientiously, and of attaching more importance to what appears than to what is. If the objects are to be wrought in wood without the intervention of special means to give them a deceptive appearance, he will give his whole attention to the details and strive to render them perfect. He will also see all the defects of his work and gradually correct them. Besides, it is not true that an object is more beautiful for being painted or polished; it should be beautiful through its form and because of correct execution. It has been urged that polish tends to keep the household article clean; for this very reason it is advisable to dispense with it, thereby habituating the children to keep the objects which they construct in the greatest possible degree of cleanliness. Pupils can use in their work but a limited quantity of raw material. It is a principle of economy that they should learn to use it in the workshop, and this habit should be formed at an early age. This raw material is exclusively wood, because it has been shown that work of this sort is most available for the purpose; also because it is an ordinary material, easy to obtain, and in short, because in general education, it is well, as far as is consistent, to limit expenditures, to render simple and maintain the unity of the material. In the series of a hundred models at Nääs, a few objects only require the use of any other material, such as nails, tacks and hinges, but even these are used in carpentry.

The pupils learn the uses of the different kinds of wood, hard and soft. They are inclined to think at first that soft wood yields more readily to the action of tools ; but practice proves that in many cases it is easier to work in hard wood. The uses to which certain objects are devoted render hard wood necessary; for others soft wood is required. The use of different kinds of wood permits of gradation in the difficulty of the work. The greater number of objects have their reason for being in the necessity of sustaining the interest of the child in the work. We have already said this many times, and we do not hesitate to repeat how important the principle is. The child who has to construct a number of experimental objects, whatever they may be, becomes wearied, works without enthusiasm, makes no progress. One observes in the Nääs series, objects of the same kind : many spoons, many boxes, many boot-jacks, many plain rulers ; but they do not follow in succession, and they are made to present different degrees of difficulty to the pupil without his passing directly from one to the other. We also insist upon gradation in the Slöjd. It is a general principle of pedagogy, that all instruction should advance from the easy to the difficult, from the simple to the complex. This principle is strictly observed in the Nääs method. This may not be clearly obvious to those who see the models exposed in the school museum. This was our own first impression. But we copied the work, and in a few weeks we had constructed thirty of the models in their order ; hence, we can declare with scientific certainty, that the gradation not only really exists, but that it could scarcely be improved upon. Let us remember moreover, that this series, as we have already said, is not the product of a mere theory—almost always defective when it concerns material things—but it is the fruit of long and patient experience. M. Otto Salomon and his colleague, M. Johanson, tried many hundreds of models before fixing upon this series. The gradation is

accomplished now by the use of a new tool, again, by another style of manipulating a tool that has already been used, caused either by the nature of the wood, as to its being soft or hard, or by giving the objects a larger size, or by different grouping, or by use of the turning-lathe or carver's tools. The pupil who has executed the first twenty-five numbers would not be prepared to undertake at once, the fiftieth in the course, the intermediate work being strictly necessary. There is no break found in it. The child who goes through the course regularly, never finds himself in the presence of an insurmountable difficulty. He begins without hesitancy, for the first efforts are designed to be simple and easy. From the first lesson of the Slöjd, he sees his efforts end with a good result, which encourages him and stimulates his zeal. He aspires continually to execute the most difficult models, and he is from day to day, more convinced of his ability to do it. In the description that we have given of a lesson in Slöjd, we have minimized the part of the instructor. We start from the principle that the child's development should proceed by his own spontaneous effort, so that he may learn to make use of his powers, and to conquer alone the difficulties and problems which present themselves. It is the application in teaching of the principle of self-help that makes men original and energetic. The teacher will not reach this result by simply imparting his own knowledge to his pupils, by aiding them directly in their efforts, by undertaking himself the more difficult parts of the model, or by giving the final touch to a pupil's work. In the Nääs system, the child begins and completes his work unaided, and he can do this because of the perfect gradation. The instructor shows how the tool should be handled in this or that case, but does not make his demonstration on the object in progress. This being furnished, he submits it to a comparison with the model, again sets forth its defects, which if possible, are at once corrected by the pupil ;

if they cannot be rectified, the teacher brəaks the piece, it is cast aside, and the pupil begins ôver again. When the child has finished his model correctly, he takes it away with him; it is his work; nobody else has contributed to it; he can show it with pride, for he has applied his intelligence and activity to a useful thing which will be received with satisfaction by his parents. The modest homes of the peasants of Nääs are thus constantly enriched by the work of the children. Is it not an admirable arrangement, calculated to render a school truly popular, to introduce into the family habits of serious industry, and to inspire the children, at the same time, with respect for handiwork and love of the domestic fireside, which is the true basis of happiness and of morality? We must, however, mention one lack in this system. The pupils work only after wooden models; but they follow at the school a course of linear drawings; why are they not taught to apply this drawing to their manual work? True, just as it is, the Nääs Slöjd gives excellent results; we have said this before and now we repeat it. It develops, in great degree, manual dexterity, earnestness, attention and perseverance, and inspires a love of work. But it confines the pupil too strictly to the production *ne varietur* of given models. The child becomes an active, correct, careful and conscientious worker, but he has not sufficient opportunity to develop his originality; his imagination cannot take the least flight; he is encircled with an iron band. We believe that manual training would gain much as a means of education, if it were intimately connected with the teaching of design and of geometric forms. It is necessary to train the pupils to work not only after models, but also after designs. The educational value of drawing is indisputable. The systematic teaching of this branch of study, trains the mind to habits of attention; teaches it how to analyze and combine forms; gives to thought a correct, clear and exact expression: makes fertile the

imagination, develops the taste and limbers the hand. In its connection with manual training, design has an importance which can escape no one's observation. It leads by purifying the taste and by multiplying and embellishing forms, to the direct application of art to industry. It is the fundamental basis of all manual occupations, which have for their object the material reproduction of forms. As it is independent of conditions foreign to form, it finds its application in all the industries, whatever the raw material which they call to their aid. This is what one perceives in all the trades. The tailor draws his patterns; the carpenter works after his outlines; the sculptor begins by designing the outlines of his ornamental work, which are to be reproduced in wood, stone or metal. For all the manual arts, design is the language *par excellence;* it has a clearness, a precision and a conciseness which words cannot attain. In his work on *The Instruction of the People*, M. P. Tempels has made perfectly clear the importance of drawing in education. No one denies these principles; why then are they not applied in school workshops? They tell us that this application, so evident in theory, meets with great difficulties in practice; that children from ten to fourteen cannot draw well enough, nor sufficiently comprehend designs, to work correctly after graphic representations. To what must we attribute the slight progress generally made in drawing by pupils in primary schools? To the method, and to the small amount of time given to instruction in this branch. Drawing is an art which requires a variety of exercises, and their daily application. Where pupils draw but an hour or two in a week, results cannot be satisfactory; and they are altogether useless if they do not conform to a natural and progressive method. The method of the academy is no more suited to the primary schools, than is the method of the universities suited for the instruction of children in the simple ideas of grammar, geometry, history and the

natural sciences. Here, more especially, it is essential to start with the psychological principles established by Pestalozzi and Froebel, to follow their application through the entire system of primary instruction, and to prepare a progressive series of designs from nature, without entering upon the domain, inaccessible to the minds of children, of plans, projections and scientific perspective. It is the eye and the hand that must be exercised in the exact perception and faithful reproduction of material forms, in going gradually from the simple to the complex. The child does not at first distinguish objects in their totality; the relief escapes it, and it does not see the surfaces, but rather the limits of the surfaces. The tracing of outlines is the point of departure for a system of drawing in the primary school; contours as they are, and not as they present themselves to the eye, with the deflections due to perspective. This drawing of outlines is the natural method; watch the efforts of children left to themselves: they reproduce the outlines of the objects that they see, such as houses, furniture, animals, etc., tracing the lines that describe their limits without troubling themselves with the relief.

Perspective drawing is for the advanced stage of instruction, and can only be entered upon with success toward the close of primary studies. But linear drawing, applied to plans, carvings and outlines etc. may be taught successfully to children, as well as the more simple combinations of lines furnishing the basis for ornamentation, and it is exactly this kind of drawing which should be combined with manual training. According to our ideas, the progressive order to be followed in instruction in manual training based upon design, comprehends, first, working after models and the concurrent reproduction of models by linear drawing; secondly, work after the models thus drawn; third, the construction of new forms, conceived and designed by the pupils and reproduced in substance.

Our experience at Nääs has confirmed this opinion. The pupils have drawn on a scale of one-half the dimensions, plans and carvings of two objects that they were not familiar with, and which did not form part of the series. They have at once been set at work in constructing after their own designs. The results were very satisfactory.

III.—Who shall Teach Manual Training in the Primary Schools?

To those who have studied pedagogical questions there is no need of demonstrating that only that instruction which has an educational basis is effectual. Instruction and education are not two different things, but two phases of the same thing. As Herbart says, "There is no education without instruction, and we cannot understand an instruction which is not educational." But there are many persons, who, although they are interested in schools, do not possess the necessary elements to decide the purely pedagogical questions which the school raises; frequently it is the case that they employ their influence in setting forth ideas, methods and solutions, which, far from being favorable to the progress of education, are in the nature of hindrances.

It is to be feared that as regards the introduction of manual training into the primary schools, erroneous ideas will spring up and find partisans in a class of people, who are in sympathy with the school, but incompetent to judge. Hence, when the question is raised in a mixed company of people who are strangers to primary instruction, the majority jump at these conclusions. First, we must annex to the primary school a course of trades-apprenticeship. Second, we must entrust this teaching to good workmen. Both of these conclusions are false. We have sufficiently reviewed the character and object of manual training in the primary school, to make it unnecessary to notice the first of them. As for the second, it may be dealt with thus. The experiments of Basedow, Francke, and others

in regard to manual training,—the educational bearing of which those illustrious teachers well understood—have failed chiefly because the instruction in this work was entrusted to artisans, who considered the school a workshop, and treated the pupils as apprentices. We have also pointed out the failure of the method in the workshops of apprenticeship at Gothenburg, where the instruction is given by artisans. On the contrary, wherever we have seen the work of instructors, or persons pedagogically prepared, we have been able to testify to the superiority of their instruction.

This is a question which has nothing to do with initiation of pupils in the mechanical processes of trades, but is to subject them to a systematic course of manual training, calculated to exert upon them a happy and educational influence. But the most skilful artisans at their trades are generally incapable of giving suitable instruction in manual training in a school. We say "in general" because there are found exceptions to the rule, choice workmen, by following a pedagogical course of manual training have sometimes succeeded in acquiring a certain aptitude for instruction, but they are very rare. The great obstacle to the introduction of this new education is not the want of money, but the difficulty of finding capable instructors. It is better to do nothing on this ground, rather than to undertake the effort with men who do not possess the technical and pedagogical aptitude; for in this case one is going straight towards an obstacle, which can furnish ground for the contention that manual training in the primary school is proved to be a practical impossibility. This is the real danger. It is important to avoid it.

It is among primary instructors that the recruiting of teachers for this work is to be done. Those of the future are to be prepared at a normal school. To meet the present want, the only practical means consists in organizing temporary courses. It is thus that they proceed

in Sweden. When, in this latter country, the question was first raised of preparing teachers for instruction in the Slöjd, it produced a general storm of indignant protestation. What! the primary teacher, that man endowed with a kind of moral, literary and scientific priesthood, to be leveled to the rank of a workman, and the school to be transformed into a workshop? Not a man of scholarship, conscious of his own dignity, and of that of his calling, but would feel abased to handle the plane and the saw before his pupils! Besides, the teachers already have a task sufficiently hard, and technical capacity fails them. This is the history of all innovations; we have seen the same phenomenon manifested in Brussels, when it was discussed whether to receive gymnastics in the schools, and more recently the teaching of geometric forms and of natural sciences. People do not, at first, well understand the need of all these proposed reforms. They lack confidence, and to resist them, they bring forward with the best faith in the world, mountains of argument a hundred times refuted! Vain efforts! Progress overrules them and when reforms are at length realized, they often find support from those persons who have resisted them with the greatest energy of conviction. In Sweden the tempest is gradually subsiding. The subject was commented upon by the press, and discussed in teachers' conventions, and the first feeling of opposition vanished. They understood that there was no desire on the part of the teachers to assume the apron and blouse of the artisan and show the children how they should work with material. Honest and useful work cannot humiliate him who engages in it. True honor lies in working for the good of mankind. Have we not seen men of high position give themselves up with a pride in doing so to work in the shop, for purposes of instruction or to gain health thereby? There is the case of Louis XVI, who was a locksmith; of Peter the Great, who became a carpenter to increase the naval power of his empire; of

Maximilian of Austria, who forged arms; of Luther, Frederic of Sweden and Louis XV. who were turners. It is a well-known fact that in the royal family of Prussia every prince must learn a veritable trade, so that his education may be as complete as possible. Does not the illustrious Gladstone rest himself from the cares of State, by exercise in wood-chopping? It is true that the primary teacher has already arduous duties. He gives thirty hours of lessons weekly; there are necessary at least, a dozen hours of preparation. Add forty-eight hours for rest, and eighteen for meals, makes a total of one hundred and six hours out of the one hundred and forty-four which make up the week, Sunday not included. There remain to him thirty-eight hours, during which it is not impossible that he should take a few to prepare himself in manual training. Moreover the fatigue of this instruction will not add materially to that produced by other scholastic duties; on the contrary, work in the shop is an excellent and healthy exercise, counteracting the cerebral excitation. It seems to us just to also take account of the increase of useful work demanded of the instructor, by increasing his compensation. Swedish instructors, having speedily overcome their prejudices, have undertaken the new movement resolutely, appreciating its importance; and to-day in nearly six hundred primary schools they teach the Slöjd. In all the schools that we have visited, at Stockholm, Gothenburg, Nääs, Alingsa, Landskrona and at Skallsjö, we have ascertained that this instruction exists, not merely in official reports, but that it is practical and efficacious. The argument drawn from the lack of aptitude and preparation on the part of teachers, no longer confronts us, since many members of the educational corps have proved by their example that the necessary capacity for the Slöjd can be rapidly acquired when one has the will and the courage to put himself to the work. It is not important in fact to transform the primary instructor into a skillful workman,

perfectly at home in all the practical processes of shop-work. The object is quite different. In two temporary courses of five or six weeks each, separated by an interval of one year, the preparation of the instructor may be made, on condition that he continues to perfect himself. We have described the system of the temporary courses at Nääs. That is a good model to imitate. And besides, in Belgium, experiments of this sort have been made in other branches more difficult than manual training. They have succeeded in giving to many of the teachers, by means of temporary courses, the necessary knowledge to instruct successfully in new branches added to the course, as gymnastics, drawing and natural science. But in the future, it is to the normal school that we are to be indebted for the preparation of instructors in manual training. In a recent conference, the directors of the Swedish Normal Schools have unanimously declared that it is highly desirable to introduce instruction in the Slöjd in these departments. Till now the Swedish Government had not taken any definite measures to this effect, but a royal order of 11th September, 1879 showed a wish to arrive at some conclusion. At the normal schools of Carlstad the Slöjd has been already taught with success for several years. The experience of the normal school of Finland, where instruction in manual training has been given since 1863, also confirms this point. In 1877 M. Otto Salomon made an interesting investigation. He addressed to the 3,363 instructors of Sweden a circular containing questions relating to manual training, among which were the following :

1. Do you possess a certain degree of practical knowledge of any form of manual training? 2. Are you disposed to teach the Slöjd? 3. Will you exert your influence to introduce this instruction into the primary school?

One thousand five hundred and sixty-three instructors responded, or 46.5 per cent. To the first question, five

hundred and ninety-seven (38.2 per cent.) declared themselves already possessed of some manual technique, eight hundred and twenty (52.5 per cent.) did not possess any. One hundred and forty-six (9.3 per cent.) did not reply to the first question. To the second question, four hundred and sixty-three (29.7 per cent.) declared themselves willing to give this instruction themselves. Seven hundred and eighty-two (50. per cent.) responded negatively. Three hundred and eighteen (20.4 per cent.) left the question unanswered.

To the third question, one thousand and ninety (69.7 per cent.) declared themselves in favor of introducing the training into primary schools. Seventy-nine (5. per cent.) made the same declaration, but under certain conditions. Two hundred and thirty-nine (15.3 per cent.) declared themselves adverse to the proposition. One hundred and fifteen (10. per cent.) did not reply at all.

These responses have an historical importance. For five years the subject of manual work has made great progress in Sweden. It is better understood. The value of this method of education is proved by experience, and one may say that to-day the large majority, if not all of the Swedish instructors, are in favor of its introduction.

There are in Sweden, as in all countries, teachers to whom we cannot entrust this training because of their age, infirmities, and so on. Moreover, many classes of boys in the large cities are taught by women.

(1) In Sweden there are at this time three thousand six hundred and nineteen male teachers and five hundred and fifty-nine women. At Stockholm in 1881-82 there were only fifty-nine male teachers and two hundred and sixteen female. At Gothenburg and in the smaller cities the proportion is the same. It is only in the country that the male teachers are more numerous. In these two cases, special teachers are to be entrusted with the manual training who are pedagogically prepared, but in no case must

workmen be allowed to teach. These results are of a kind calculated to encourage those in other countries who devote their efforts to the constant improvement of public instruction and notably to the introduction of manual training.

IV.—The Pupils.

At Nääs manual training is only taught to the pupils in the higher classes of the primary school. M. Otto Salomon thinks however that this training should be given to all children, beginning at as early an age as possible. But he is anxious to insure the success of the reform and to establish a practical method. The work was very considerable and it would have presented insurmountable difficulties, had it not been limited. The time was not ripe for a complete organization. To formulate theoretical principles,[18] and to strengthen them with solid arguments, is not difficult; the elements of such an undertaking as this exist in many enterprises; it is enough to reunite them and to accommodate them to the circumstances of the time. It is however, very different when we propose to go out from the domain of theory to found a method governed by principles and established by practice. The wisest course then is to concentrate all our efforts upon one aspect of the question, and when we have arrived at a satisfactory solution, to complete the work already realized in part. It is thus that they proceeded at Nääs. We may say that one of the reasons why the instruction in Slöjd was rapidly adopted in the Swedish schools, was because they first introduced it only in the higher classes. The lowest age for pupils in wood-work is twelve years, but they can commence a year or two sooner; it depends

18. In Belgium they have adopted this course. In 1884 the city government of Brussels incorporated instruction in Manual Training into its Normal School System. The program includes the exercises of the Froebel method, work in card-board, wood and modeling, in addition to the study of the history and methods of Manual Training. Moreover in 1885 and 1887 Brussels organized courses of preparatory study for teachers in this Method of Instruction. The community of Saint Gilles (a village near Brussels) established a similar course in 1885. Finally the Government has followed out this plan by organizing in 1887 a temporary course at the Normal School of Nivelles.

upon the bodily strength of the pupils. We have seen in the work-shops, of the schools of Nääs, of Stockholm, and other places, pupils of eleven and even ten years of age, who worked without difficulty at the work-bench. In Sweden there are, on the average, for a member of the instructing corps, eighty-seven pupils, of which forty-five are boys, and forty-two girls. Of this number there are about twenty boys of twelve years old who can undertake the wood-work. An instructor can teach manual training to a group of a dozen pupils. When the number is greater, the oversight is too difficult; the children misuse the tools, acquire incorrect habits in the work, and make little progress. It is better to begin with four or six pupils, chosen from among the most intelligent and the most active, and when they have acquired a certain degree of aptitude gradually increase the number to a dozen. An ordinary school numbering twenty boys of a dozen years and over would comprise two sections for manual training. There may be added to it younger pupils who are strong and vigorous. The best means of discipline is temporary or positive exclusion from the work. It is applicable to negligent or indolent pupils and is always efficacious, because, as experience proves, children are very fond of the occupations of the workshop.

V.—The Place.

The class-room is unsuited for wood-work, as we cannot conveniently dispose the benches and tools, and after each lesson it would be necessary to clean the floor. When a school-house is built it is easy to arrange for a special room for the purpose. In those already built, a large class-room can be divided, or some room taken which is not indispensable for general use; or the basement or attic may be made available, as at Gothenburg. Otherwise a workshop can be constructed in the immediate vicinity of the school. In all cases the arrangements found

to be satisfactory are these: there should be a sufficient distance between the shop and the class-room to prevent disturbance by the former during recitations. The rectangular form is most convenient; the benches being placed perpendicular to the long side. For the simultaneous work of twelve pupils, the room should be, at least, 5.20 metres by 6 metres, or about 2.75 square metres to each pupil. When a turning lathe is among the furnishings, the room should be longer by one metre. The height must not be less than 350 metres. The windows should be large, their openings occupying 25 to 30 per cent. of the surface of the wall, and it is well to place as many as possible on all sides; their lower boundary being at least 1.50 metres above the floor so as to avoid the breaking of the glass by the chips. It is well to finish the wall in panels two metres in height and to paint the remainder in oil-colors. The stove must have a provision for the preparation of glue. The temperature must not exceed 12½° C. for work at a bench greatly increases the temperature of the body. A cabinet for tools is not indispensable. They may be arranged in racks along the walls, if care is taken to number and group them in their order, so that they may easily be found when wanted. If the work is done at night, lamps should be suspended by chains, in such a way that they may be made to slide from place to place where bench work requires this. Near at hand there should be a place for models and finished work. The wood should be kept in a shed, well dried, and not far from the shop, which should communicate with the former by a door at the side. Wood may also be kept in the loft.

VI.—The Time.

The time for manual work should be at least two hours. In fact it takes some time to arrange the tools, materials and models, both before and after the lesson. If we devote but one hour to it, the work is interrupted while it

is scarcely under way. Four hours is too long a time, and fatigues the children. Two to two and a half hours is the safe medium. In order to obtain any results the work must take place at least once a week. This is the most favorable plan; and where there are several instructors in a school, this teaching can be divided between them. It is generally better to give the morning hours to purely intellectual studies, and the afternoon to manual work. In some places they suspend study one day in the week, and give this time to the occupations of the work-shop.

VII.—The Material.

The materials used consist of tools, models and the raw material. It is important to reduce their cost to a minimum. The experience of Nääs shows the cost of the necessary tools for simultaneous work in classes of from 6 to 12 pupils. We append this list with the price of tools in Sweden. (See Appendix, p. 48.)

The collection of models (see Appendix, p. 49) costs about 70 francs. We have already explained the principle on which this series of models was based. The raw material consists of nails, glue, and wood of various kinds. The wood is taken in the rough and with the bark on. At Nääs they state that, on the average, the expense of the wood used for the first twenty-five models amounts to 1.88 fr., for the next twenty-five models amounts to 3.75 fr., for the last fifty models amounts to 15.62 fr. Total for the one hundred models, 21.25 fr.

If the hundred models are constructed in three years, the annual cost per pupil, for raw material, is reduced to 7 francs. In the country, it is less. In Belgium this sum would be much greater, because wood is much more expensive. Table II shows the list of one hundred models.

VIII.—Manual Training in the Public Schools of Stockholm.

The Swedish people is one of the best educated

of all Europe, and the primary schools of Stockholm may be classed among the best in the country. Since the promulgation of the law of the 11th June 1842, which organized primary instruction and declared it obligatory, the State, the provinces and the commune have made continual efforts to suppress ignorance, and now we find but few illiterate persons in this country whose population is distinguished by its morality, good sense, and activity. All Swedes can read and write, and they are generally fond of reading. Public libraries and newspapers are wide-spread. It is rare to meet with any family of a peasant or working man, that does not pass some hours of the week in reading the newspaper or some book. During the last thirty years, in spite of the increase of population, crime has diminished. The great progress in education and the law prohibiting the free sale of alcohol, have combined to produce this happy result. From 7 to 14 years of age children must go to the public school, unless they receive instruction in an authorized private school, or follow the public school course. At the end of the required course of study all the pupils of the public schools and free schools submit to an examination after which they receive a diploma. They have succeeded in extending primary instruction even into the central and northern part of Sweden, where all the conditions were extremely unfavorable. The population is spread over a vast extent of country; the villages are small and poor and very far apart; and moreover, during a great part of the year, the roads are rendered impassable by snow drifts. In spite of these seemingly insurmountable obstacles, elementary teaching has penetrated into the farthest and most isolated cottages, thanks to the invention of itinerant-schools. The teacher in these remote regions moves several times a year. He establishes himself in some hospitable farmhouse, and the children of the neighborhood come flocking to their lessons. After assigning to them their duties and

organizing a corps of monitors, he goes to establish similar conditions further on.

The primary schools of Stockholm are very well organized. For twenty-five years a man of high intelligence and rare energy, M. Meyerberg, the inspector-general, has spared no pains to bring them up to the highest level of modern progress. These schools are not externally remarkable for the imposing aspect of their facades ; so far from appearing to be more than they are they are more than they appear. They are generally surrounded by large grounds devoted to recreation. What particularly impressed us was the neatness, the fine bearing, and the politeness of the pupils, and the order and discipline which everywhere prevailed. The classes are provided with good geographical charts, prints of geological specimens, objects in natural science or natural history ; collections of geometric forms, weights and measures, apparatus of physics and chemistry, and all objects necessary to give the lessons according to the very best methods. Gymnastics are taught by a system very different from that of Germany, France, and Belgium. We were present at some of the lessons, and can testify that the exercises are energetic, methodical, full of entertainment and life. There would be, as we thought, a real utility in studying, on the spot, this system so little understood with us, which owes everything to science and nothing to fancy or routine. The pupils of a school are organized into companies for the practice of military drill including use of firearms. This instruction which forms habits of discipline, and prepares pupils for service in the army, has not, we are assured, inspired warlike tendencies or taste for vain parade, consequences which have been much feared elsewhere. At Stockholm many classes of boys are taught by women. It is thought that women of equal education have generally more aptitude for elementary teaching than men ; on the other hand, the recruiting of the ranks of fe-

male teachers is more easily done, because they can, more easily than men, live on the minimum of salary appropriated for these positions.

All the boys in the higher classes of the primary schools pursue the course of Slöjd. It seems useless for us to relate in detail the circumstances of our visits to different schools, where all follow the same method. We shall confine ourselves to the generalities which it seems most important to make known. On the 30th December 1875, the school committee published a report addressed to the board of direction in which it advocated the principles of primary manual training. It declared that this instruction ought to be made a part of the pedagogical school course ; that its object was, like the other branches, expressly to cultivate the child's powers; that it should be so organized as to train the eye and the hand, to give to the pupils habits of order and attention, to develop in them courage, energy, judgment, a spirit of observation and a sense of the beautiful.

During the first period of organization these principles were not fully understood by the persons engaged in teaching ; they did not follow a systematic course, going from the easy to the difficult ; the pupils worked without plan or method, and results were not satisfactory. Many trades were taught in the schools. In 1882, the board of managers authorized M. Berg, inspector of instruction in the Slöjd to visit the principal schools of the country, in order to report concerning reforms to be introduced into the system of manual training at Stockholm. On his return, M. Berg proposed to adopt the Nääs method, which he considered the best, most complete, and best adapted to the pedagogical purposes which he is anxious to accomplish. "This is the only method," says his report, "which can serve as an example for a good system according to the views of this board." The pupils of the Stockholm school are now engaged in the manufacture of

objects after models of the series of Nääs. A greater part of these models remained such as they were; a few only have been modified or replaced, because while excellent for the country they are of no use in a large city. Each school is provided with tools for carpentry, turning and carving. In the Nicoläi school, there is a special shop for carving; and there we find pupils who, having finished the course of Slöjd, show special talent for this branch of the work. They begin with geometric forms, and when the pupils have acquired a certain degree of skill, they pass on to the antique style, and it is only after this that they make ornaments in rustic work. We were present at an interesting lesson in carving given at this school by Mlle. Nerpin, to about a dozen pupils. The manual work is independent of the drawing instruction. Inspectors Meyerberg and Berg tell us that it is essential in the higher classes to continue instruction in free-hand drawing and in linear design at the same time with instruction in manual training. We entirely agree in this opinion. It was not possible to charge the regular instructors with the Slöjd teaching, because they were unprepared. The city therefore sent instructors to follow the course at Nääs. It still employs a certain number of special teachers, but this is only a provisional arrangement. In the near future this instruction will be given exclusively by the teachers.

The pedagogical principles of Nääs are also rigorously put in practice at Stockholm. The pupil is proprietor of the object made by him; but if ill made, he cannot take it away: it is broken. The oversight of the training is rendered efficient by two measures which suit admirably. When an object is finished a ticket is attached to it, bearing the number of the series, the number of hours given to its construction, the name of the pupil, the exact appreciation of the teacher, stating whether it is "well done," "with great success," or "with the greatest success." When the inspector comes he examines these

objects, and consults this certificate. His approbation authorizes the return of the object to the pupil. The teacher produces a register in which are inscribed the causes of absence, the progress of pupils, and the time they give to the construction of each object. These registers also show that the average age of the pupils in Slöjd is 11.8 years and that about 76 per cent. quit school after going through the complete course. In the Slöjd rooms the tools are placed in their racks in perfect condition and order; one can at once find the tool he requires, and a glance suffices to decide whether they are all in place. Compartments are arranged for placing temporarily any unfinished models, or to preserve for inspection such as may be finished. Raw material is supplied by the administration at the opening of the year, and sent into the schools.

In every school of Slöjd there are four sections of twelve pupils each, classification being according to aptitude. Each section works three times a week for 2½ hours each session. Pupils who pursue the course of carving are occupied at this work five hours a week. We visited also a school of Slöjd founded by M. Winborg, manufacturer, Adolph Frederick School, in which they teach several trades; work in metal, locksmithing, carpentry, and turner's work. The children are from ten to fourteen years of age. The metal work comprises the construction in copper wire of objects such as bottle-cases, bottle-racks, key-rings, baskets, bird-cages, etc. The pupils learn also the use of the file, to bore holes, to put in rivets, and springs, to make boxes of tin, watering-pots, sleds, fire-escapes, etc. A steam-engine supplies power for the turning lathe and other machines. The pupils are intrusted, by turns, with the duties of firemen. It will be interesting to know the results of this experiment. In review, the instruction in manual training at the Stockholm schools produces excellent results. It is generally conceded that

the Nääs method is superior to any other, from a pedagogical point of view; but the inspectors think it is essential to combine closely the Slöjd and the instruction in drawing.

Conclusions.

These are the conclusions that were submitted to the Belgium Department of Education in 1883, based on the foregoing report.

I. Manual training should become a part of the programme of the primary schools in order to insure integral and harmonious cultivation of all a child's faculties by a progressive and systematic development of manual dexterity or technical skill, which, in the curriculum now in operation is not the object of any special exercises.

II. The instruction in manual training ought to be based on the same pedagogical principles as the instruction in other branches of the course; it has in reality for its object the formative culture of the pupil, and not an apprenticeship to any specific trade.

III. To assure to this industrial training the pedagogical character essential to it, we must put it in charge of the regular instructor.

IV. The preparation of instructors actually on duty can be accomplished by means of temporary courses. It is at normal schools that these instructors will hereafter be prepared.

V. The programme of instruction in industrial training comprises

A. First grade, primary schools, pupils from six to eight years old. Occupations of the Frœbel method, three hours per week.

B. Second grade, primary school, pupils from eight to ten. The same occupations, but more especially the modelling in card-board and paper,—three hours per week.

C. Third and highest grade primary school, as well as the schools preparatory to the normal school, pupils from ten to sixteen. Work in wood after the method of M. Otto Salomon, from three to six hours per week.

D. Normal schools. Practical and theoretical training of future teachers in the course given under A, B, and C.

VI. Instruction in manual training should be closely combined with that in geometric forms, and in drawing.

VII. In order to insure good instruction in this industrial training in normal schools a temporary course should be organized. It would be useful to send some instructors to Nääs in order that they may pursue there the entire course.

Records of the Progress of Manual Training in Primary Schools for Boys.

BELGIUM.—In 1881, Manual training was added to the course of the normal schools, but in so timid a manner as to enable one to foresee that the instruction would not very soon become general. One reads there at the end of the programme, after the table of employment of time, this announcement: "Manual training in the work-shop takes place during recreations as follows: two hours weekly for the first two years of study, and one hour weekly for the remainder of the time." Only there was no work-shop and no teacher. So in the great majority of normal schools for male teachers, this arrangement was a dead letter. In the normal school at Brussels they did however put their hands to the work. A course of manual work was organized in 1881 and 1882. This course comprised wood-carving and work in card-board. At the normal schools of Lierre and of Huy efforts were made. The programme proposed by M. Sluys and M. Van Kalken in 1883 could not be carried out in the Government normal schools, the elections of 1884 having brought about the disorganization of public instruction. The normal school for males at Brussels was suppressed by the minister, M. Jacobs, the 28th of September 1884, at the same time with the normal school of the Rue des Visitandines and seven other similar institutions. The city of Brussels has fortunately re-organized these two courses of manual instruction and the training now forms part of the obligatory course of the normal school for instructors, work-shops for wood-work, modelling and card-board work having been annexed to this school. For the wood-work they make use of the system of Nääs. Work-shops for carpentry, turner's work, and locksmithing have existed at the common school No. 12 for some years, indeed since 1876. To-day they use there the system of professional apprenticeships and there are workmen who give the courses. Temporary courses have been organized by the city of Brussels to prepare teachers for their duties. These courses are given at the normal school. An analagous course has been adopted at Saint-Gilles, near Brussels, by the public administration. At the provincial institute for deaf mutes at Berchem-Sainte-Agathe (Brabant) courses of manual instruction are given. The occupations of the Frœbel system, the card-board and wood-work after

the method of Nääs make up part of the programme for the pupils of the elementary and primary grades. Pupils over fourteen pursue the professional course.

Sweden.—Instruction in manual training is actually given in 700 schools. The method of Nääs is constantly gaining ground. At Gothenburg the system of trades-apprenticeship cost 13 francs per pupil (1883): and the shops were attended by 1776 boys of from ten to fourteen years of age. The normal course at Nääs was pursued by 126 persons, of whom 107 were Swedes, 4 Finlanders, 2 Norwegians, 2 Germans, 2 Russians, 2 English, 1 Danish, 1 Dutch. Two important changes have been made in the method: work after designs, and work where the right and left hand alternate.

In the school for girls, they have introduced wood-work as a means of education and of gymnastics. We must call attention also to the *Praktiska arbeteskola*, directed by Miss Rodhe at Gothemborg. There they instruct children of both sexes in Frœbel occupations and in wood-work by the Nääs system. The economic societies and the general councils have distributed 196,000 francs.

Finland.—In this country manual training has had a great development, since the efforts of M. Cygnæus. In 1858, this reformer visited the various countries of Europe, and the ideas of Froebel excited a great influence over his mind. He took the initiative and introduced manual training into the schools of his country. The law of 1866 made manual training an obligatory part of the course of both primary and normal schools. The regular teacher instructs in the *Slöjd*. The pupil-teachers are trained in carpentry and joining, carving, and in wood-work, basket-making, iron-work, and working at the forge. A commission presided over by Uno Cygnæus is charged with the directing of manual work. The imperial senate devoted the sum of 500,000 marks, (Finnish money) to found a normal school specially equipped to prepare each class of primary teachers for instructing classes in *Slöjd*. They thus prepare for the introduction of this instruction in some establishment of higher education.

Norway.—Since 1860 manual training has been introduced into a certain number of the schools, where wood-carving, locksmiths' work etc. are taught. The Government subsidizes the communities in which it has been adopted. M. K. Kjennerud, inspector of schools, has been commissioned to make investigations in Sweden, Denmark and Germany in regard to this subject. His report has just been published in which he proposes that Government should introduce manual training, by means of subsidies, into all elementary schools in city and country; into normal schools, and gymnasias; and he asked that final examinations may include this subject. He proposes moreover, that in the

universities there may be work-shops for the use of students, that a subsidy be granted to the scholastic administrations for supporting competitive examinations in models, that teachers be directed to follow the Nääs system in order to prepare themselves in the art of teaching manual work. The ex-president of the Storthing, M. Svendrup, now minister of State, has instituted a radical reform in primary schools. He advocates the introduction of manual training as a means of early development of a manual skill, whose influence on the moral and physical welfare of the country appears to him to be of unquestionable importance.

DENMARK.—A course of manual training is in progress at Copenhagen at the school of the *Cercle*, founded for the purpose of propagating the system of the *Slöjd*. This course is attended by pupils of primary schools as well as by those of a higher grade.

GERMANY.—In Germany an active propaganda is carried on in the interests of manual training. It is generally to the private enterprise that we owe the introduction of manual training into a number of schools of this country. In 1878 a teachers' course and a manual training school for boys was established at Berlin. M. Wilski introduced this branch into the orphanage of Rummelsburg. The provincial government of Hanover granted in 1879 a subsidy of from 1000 to 1500 marks to M. Th. Raydt of Lingen to provide for a temporary course. M. Lammers publishes at Bremen the *Nordwest*, the organ of the central committee of manual training. In the orphanages of Bremen and Hanover and in the agricultural school at Ebstorf this instruction has been given for several years. Independent schools have been founded at Bremen and at Emden and in other localities in Northern Germany. We may also mention the temporary courses of Osnabrück, of Sophienhoff and the schools at Kiel; in the last named there are taught basket braiding and brush making, basket-making, wood-carving and card-board work. At Königsberg this instruction forms part of the programme of the higher classes of primary schools. The burgomaster of Posen, M. Hersez, is the promoter of the movement in that City. There they introduced in 1882, a course for boys and a temporary course to prepare teachers to instruct in wood-carving; M. Gartig, director of this course is a warm partisan of the Nääs method. In many schools in Silesia they teach joining, card-board work, basket making and braiding. M. Kranz, the director, says that "this instruction exerts a salutary influence upon the intellectual development of the children." At Goslitz M. Schenkendorff founded in 1881 a school composed of seven divisions of fifteen boys each, and a course for teachers; the programme comprising modelling, carving and card-board work.

In Saxony this movement has made great progress. The *Gemiennützziggesellehaft* of Leipsic appointed M. Clauson Kaas to give the temporary courses in 1882. In the school of Dr. Barth the manual occupations are closely connected with the other branches of the primary course; they are considered the necessary complement of a general education. There are many other places where efforts are made with the same motive and conviction. It is the *pedagogic* or *educational* system which everywhere finds most partisans. German primary teachers in the majority of cases have not yet rallied round this standard; but there is no doubt of the appoaching triumph of this great reform in educational method.

HOLLAND.—The idea of associating manual work with primary studies finds many advocates. In 1876, M. Kerdyck made known the system of Clauson Kaas, in the columns of the Magazines. In 1879, M. Bouman published a report on Manual training in Sweden and Denmark where the Minister of Education had sent him. M. Groeneveld, of Rotterdam, is working hard for the advancement of this reform: He founded a school in 1876, for the purpose of giving the normal course to teachers. This instruction is given in more than thirty schools. A special organ was issued last year in the interest of this system entitled *Tijdschrift voor handenarbeid* and is published by Wolters, of Groeningen.

FRANCE.—In France the Revolution took up the ideas of Jean Jacques Rousseau concerning manual training and strove to put them in practice. Different decrees, and even the Constitution of the year III, made it obligatory on all the citizens to learn some manual art. But these laws were not put into execution. A report of Jomard, published in 1842, describes the method, of the school of C. Fichet founded in 1832, in which Manual training was taught, including *modelling in clay and wax, molding in plaster, turning in wood, metal work.* This was a sort of an Industrial School, and not a primary school, properly speaking. Since then a number of schools have been established in which the programme includes work in materials. According to M. Gerard they are of one of the four following kinds:

I. *The primary school in the work-shop*; the pupils taking the theoretical course in a place which is an annex to the shops. II. *The work-shop in the primary school:* where the period of primary instruction being ended, the pupils enter the shops annexed to the schools. III. *The primary school and work-shop in conjunction*; the children who have reached the age of ten years continuing to receive general theoretical instruction at the schools and passing part of the day with the masters in the shop. IV. *The school for apprentices properly so called*; where pupils from eleven to twelve years old serve their

apprenticeship in the shops and receive in the school a supplementary instruction in theory. All these schools aim towards the remedy of abuses incident to the apprenticeship to masters, and to increase the opportunities for instruction to children destined for trades. They have no real pedagogical character. Other attempts have been made. In 1873, the City Council of Paris founded the school of apprenticeship of La Villette, and about the same time the primary school of the Rue Tournefort was fitted up with a work-shop, thanks to the influence of M. Salicis, and M. Léveillé. The school of La Villette is open to children who have finished their primary studies. During one year they receive ordinary technical instruction; the second year they are divided among the several shops; this is in reality a school of primary apprenticeship, with a year of probation during which the pupils choose their occupation. In the school of the Rue Tournefort, manual work and theoretical study go side by side. The children are exercised in different occupations during several years; when they have reached a certain degree of skill they specialize and enter one of the following groups; modelers and carvers, turners, apprentices in wood-work, or in iron work. It is a school of apprenticeship superimposed upon the primary school.

Thanks to the intelligence and energy of a few men of enterprise, among whom are M. Paul Bert, former Minister of public instruction, M. E. Buisson, Inspector General of primary schools, M. Salicis, Léveillé, Senators Tolain and Corbon, and deputy Nadaud, the subject of manual training has made great progress in France. The last three are former workmen, and know by experience the economic and educational value of this reform on which they have, in a great degree, assisted. The efforts of these men have accomplished an important result, and the law of 28th March 1882, concerning compulsory education has introduced manual training as an obligatory branch of primary school teaching. The programme comprises:

I. In the infant schools, (2 to 7 years) occupations of the Froebel System; folding, weaving, braiding, combinations in colored worsteds on paper, or canvas; and simple kinds of knitting work.

II. In primary schools for boys. A. Elementary course; Manual exercises to promote dexterity. Cutting of card-board into geometric forms, basket-making with plaits and straws of different colors, Modeling, reproduction of geometric solids and very simple objects.

B. Intermediate course; Construction of objects in card-board covered with colored drawings or made of colored paper. Little-works in wire and wood, such as bird-cages, modeling: simple ornament in architecture, acquaintance with the simple tools.

C. Higher course; Exercises combining drawing and modeling,

sketches of objects for construction, and the making of these from the sketches and *vice versa*. Study of principal tools used in wood-work. Graduated practical exercises. Planing and sawing, in simple groups of objects in wood. Boxes nailed or joined without tacks, wood-turning in very simple objects. Study of the principal tools used in iron work, filing and finishing of objects rough from the forge or just from the foundry. According to this course, manual training is concurrent with other branches in the general education of children and in professional preparation.

The directions placed at the head of this programme define the object of it in these terms: "Manual training has a double purpose; on the one hand, to strengthen the body, to invigorate the constitution of the child, to place him in the hygienic conditions most favorable to a general physical development. On the other hand, to give to him at an early age, the qualities of readiness, quickness, and manual dexterity, that promptness and certainty of movement, which while most valuable to every one, is specially necessary for such pupils as are destined for some manual profession. Without losing their essentially educational character and without being transformed into work-shops, primary schools can and should give to bodily exercise sufficient attention to prepare and predispose boys in some degree, for future duties as workmen or soldiers, and girls for housekeeping and feminine work. Since the promulgation of this law, application of the programme has been made in a number of primary schools; in large cities, as Paris, Lyons, Marseilles, Bordeaux, and others. They have annexed work-shops to the primary schools, and manual training is taught by competent workmen; in the rural districts it is the instructors who have themselves put their hand to the work. At the Congress of Havre in September, 1885 the instructors voted by a large majority in favor of the introduction of manual training into the Public School. The conclusions of the report of M. Réné Le Blanc were adopted.

England.—We observed at the London Exposition in 1884, the following facts.

A. Birmingham School.—Models of mechanical and physical apparatus, made by boys from 11 to 13 years old; generally rudely constructed; we perceive that there is here no regular course of manual training, and that the objects are made by the pupils without plan or method. Among them we notice a wooden windlass, a compass, pulleys, inclined planes, levers, siphons, etc.

B. Central School of the Sheffield Association.—A regular course is given to the pupils of the higher class in the shop annexed to this school. This course has no professional tendency, but a purpose purely educational. The pupils work three or four hours a week.

The objects exhibited comprise; a door with panels; a piece of frame work for roofing; a wheelbarrow; geometrical solids in iron and wood; different parts of joiner's work. The programme consists of construction of geometric solids, such as the cube, hexagonal prism etc.; models in wood for instruction in drawing; groups; reduced models; apparatus of mechanics and physics, such as levers, windlasses, capstans, pulleys, wheels etc.; models of roof-timber, arches, bridges, etc., in a word, iron-work, and wood-work. There is in progress there, judging from the work shown and the reading of the catalogue, a course of faithful Instruction in manual training considered from its educational side. The work in material appears to be intimately associated with the instruction in geometrical forms.

C. Finsbury Technical School. This school exhibits parts of wooden boxes in groups, and a model of a door with panels; these are the work of young persons from 15 to 20 years of age, who pursue the course of joiner's work with Mr. H. Haynes; these pupils are not workmen-apprentices, but amateurs who are occupied during the day in intellectual studies and regard the manual training as a gymnastic exercise for recreation.

D. Finsbury Intermediate School. Here they teach carpenter's work. The course is optional, and is little patronized; the school Commissioners do not encourage the pupils in it—quite the contrary.

E. Clapton School (School of the Company of Grocers). Optional course of manual training, 25 pupils out of 400, take this course. Wood-work, Useful articles which remain—the property of pupils; Manufacture of school furniture.

The London Times of 13th November, 1884, published a favorable article on the subject of Mr. Salomon's work at Nääs.

SWITZERLAND.—At Basle in 1882, instruction in manual training was introduced into one primary school by a few students. They understood in that country, that the first condition of success in this direction, was to prepare instructors for the work. A special course was then organized at Basle, and thirty nine delegates from nine cantons, followed the instruction given under the direction of Dr. Binschedler, and Prof. Ruden Schmidt.

The programme comprised joiner's work, wood-carving and cabinet making. Manual work is definitely pursued in the Normal school of Hofwijl. At the Educational Exposition at Berne in 1884, manual training was represented by the work of pupils, by models from Nääs and by books on the general subject. A special organ has been issued in its interests, *Der Pionier*, which is published at Berne. M. E. Luthi, director of the pedagogical museum, is the publisher.

AUSTRIA.—In 1883, it was proposed by the Reichstag to introduce

manual training into the schools. The instructors at first showed but little favor towards this innovation. A few, better inclined, put their hand to the work. Five teachers from Vienna went to Nääs and pursued the autumn course. On their return they exhibited the models and tools, and gained many adherents to the cause. The *Deutsche Zeitung* of Vienna expressed on October 11, 1884, itself in a very favorable manner concerning the system. The simplicity and practical utility of the method of Nääs is highly appreciated and commended in this article. This system of instruction is going to be introduced without delay into the primary school directed by M. Urban.

Spain.—M. Manuel B. Cossio, director of the pedagogical Museum of Madrid has direction of a course of manual training. M. Cossio was favorably known at Brussels at the time of the International Congress of 1880. He taught several years at the *Institucion de Ensenanza*, founded for the purpose of propagating in Spain the principles of this new method of education. Under his intelligent guidance the subject of manual training will make rapid progress in Spain.

Russia.—At the Expositions of 1872, and 1882, as well as at the Congress of Teachers held at St. Petersburgh in 1881, there was exhibited manual work executed by the pupils of several schools. The tendency was professional rather than pedagogical. In more recent years the subject has been studied in its pedagogical aspect. It was M. J. Wischnegradski, director of technical schools in Russia, who took the initiative in this matter. He visited last year the schools of Sweden, and was there convinced of the high importance of the work, considered as a means of education. The Minister of public instruction has just introduced this instruction into the primary and normal schools of St. Petersburgh. His new education was inaugurated here on the 18th of November 1884, in presence of the most distinguished leaders of educational thought in St. Petersburgh.

Japan.—The new method of instruction makes rapid progress in this country. We had opportunity to admire, at the London Exposition of 1884, the collection of material from the schools of this country; there were minerals, animals, insects, fish, reptiles, and molluscs, preserved in alcohol; scientific herbariums of an exactness and elegance which we have never seen equalled elsewhere; engravings; very simple and ingenious apparatus for physics and mechanics constructed by the professors and pupils. Manual training has just been introduced into the Normal school of Tokio.

TABLE I.—Tools Used at Nääs.

TOOLS.	PRICE OF TOOLS IN SWEDEN. K.	O.	Number of this tool necessary for simultaneous work in class of 12.
1 Turning Web	1	30	3
2 Leveling Saw	1	40	3
3 Common Saw	1	70	4
4 Compass Saw	0	78	1
5 Back Saw	2	25	3
6 Jointer Plane	2	80	8
7 Jack Plane	1	05	8
8 Smoothing Plane	1	60	8
9 Curve Plane	2	00	1
10 Round-nose Pincers	0	32	2
11 Flat-nose Pincers	0	35	2
12 Pliers	0	70	2
13 Tongs (Smith's)	0	60	3
14 Set of Paring Chisels	3	40	2
15 Set of Mortise Chisels	4	25	1
16 Gouges	3	90	1
17 Flat File	0	55	4
18 Round (½) File	0	55	6
19 Rat-tail File	0	55	4
20 Triangular File	0	25	4
21 Center-bit and Augers (24)	5	25	1
22 Awl (and case)	0	90	3
23 Knife	0	35	6
24 Draw Knife	1	00	3
25 Hammer	0	65	8
26 Mallet	0	55	6
27 Compasses	1	00	2
28 Double Compasses	0	60	2
29 Mandrels	0	14	6
30 Screwdriver	0	30	3
31 Wabstrinque	0	45	6
32 Priming Wire (artillery) or Spout (Ger. Löffeleisen)	0	25	6
33 Screw-press	1	00	2
34 Axe	2	00	1
35 Beam Compasses	0	50	8
36 T-bevel	0	65	2
37 Try Square	0	25	8
38 Glue Pot and Brushes	1	60	1
39 Grindstone	4	50	1
40 Oilstone	0	45	3
41 Joiner's Bench	25	00	8
42 Metre (yard measure)	0	45	4
43 Turner's Chisels	6	00	1
44 Turner's Gouges	5	00	1
45 Sand-paper	1	65	
46 Turning-lathe	70	00	1
	160	79	

At Nääs a complete outfit for 12 pupils costs 600 francs.

TABLE II.

Series of 100 Models used in the Nääs Method.

All these objects are in wood. Those marked with a * are turned. Price of entire collection, 50 crowns, or about 70 francs.

MODELS.	TOOLS EMPLOYED IN MAKING EACH OBJECT. The numbers correspond to those of 1st column, Table I.
1 Pin	3, 34, 23
2 Prop, for flowers (round section)	3, 23, 26
3 " square or diamond shaped	3, 6, 37, 35, 23, 18
4 Label	3, 7, 6, 37, 35, 27, 23, 21, 18
5 Clothes-pin (without spring)	3, 8, 1, 35, 7, 23, 18, 29
6 Pin for horse-collar	3, 37, 1, 23, 14, 21, 5, 18
7 Paper-knife (or cutter)	1, 6, 35, 3, 23, 18, 29
8 Clothes-horse (or frame)	2, 7, 6, 21, 35, 31, 23, 18
9 Butter-Paddle	1, 3, 6, 35, 27, 35, 14, 23, 18, 29
10 Small flat rule	3, 6, 37, 35, 27, 5, 14, 23, 18
11 Cross-bar support for flower-pot	3, 6, 37, 35, 27, 5, 14, 23, 18
12 Spoon	3, 34, 7, 1, 14, 23, 16, 26, 32, 29, 18
13 Handle for hammer	2, 31, 23, 5, 18, 29
14 Spoon	3, 34, 7, 14, 23, 16, 26, 32, 29, 5, 23, 18
15 *Tool-handle	3, 34, 25, 21
16 Butter-Spoon	3, 34, 7, 1, 14, 23, 16, 26, 32, 18
17 Board on which to cut bread	3, 7, 6, 37, 35, 27, 1, 14, 17, 8, 21, 29
18 Sock-form (for laundress)	3, 2, 7, 6, 21, 35, 31, 8, 18, 29
19 Sugar-scoop	3, 34, 7, 6, 1, 14, 8, 23, 27, 16, 32, 18, 29
20 Stocking-frame (for laundress)	3, 2, 7, 6, 21, 25, 31, 8, 18, 29
21 Scythe-whetter	3, 6, 37, 35, 8, 23, 18, 1, 31, 5, 18
22 Pegs	3, 7, 6, 36, 35, 27, 21, 8, 5, 23, 14, 18
23 " *Turned, mushroom shape	3, 7, 6, 37, 35, 27, 21, 7, 5, 2, 3
24 *Pin or plug for horse-collar	3, 34, 25
25 Axe-handle	3, 34, 6, 35, 24, 31, 8, 37, 3, 18, 29
26 Small dish for soft soap	3, 7, 6, 16, 32, 29, 35, 8, 14, 18, 29
27 Peg to darn stockings on	3, 34, 25
28 Sugar spoon	3, 34, 7, 14, 23, 16, 28, 32, 29, 5, 18, 21
29 *Bread-pricker (Swedish "Stapp")	3, 34, 25, 12
30 Open-work for Flower-pots	3, 7, 6, 37, 35, 5, 8, 25, 18, 23
31 Stool for Trellis	3, 7, 6, 37, 35, 5, 8, 27, 1, 21, 16, 18
32 Rake-head	2, 6, 8, 31, 23, 18, 37, 35, 15, 27, 21, 18, 29
33 Pot Spoon	3, 34, 7, 1, 14, 8, 16, 32, 29, 24, 5, 31, 23, 18
34 Beetle	3, 34, 6, 35, 29, 8, 37, 21, 23, 27, 1, 14, 17, 29
35 Flour Spoon	3, 34, 7, 2, 16, 32, 29, 24, 31, 5, 14, 23, 18
36 *Weaver's Pulley	3, 34, 25, 27, 37, 5, 21, 14
37 Mallet	3, 6, 37, 27, 2, 8, 17, 35, 21, 29
38 Bread-shovel	3, 34, 7, 6, 1, 23, 35, 5, 14, 31, 8, 18, 29
39 Large flat rule	See Model No. 10.
40 *Boot-jack, with spur	37, 6, 37, 35, 23, 5, 14, 8, 18, 29
41 Shuttle	2, 6, 37, 31, 23, 18, 27, 16, 35, 1, 23, 14, 22, 18, 29
42 Nail-box	3, 7, 6, 37, 35, 27, 23, 14, 5, 2, 6, 8, 25, 29
43 *Roller for pastry	3, 34, 25
44 *Boot-jack (turned feet)	3, 2, 1, 6, 31, 23, 21, 35, 18, 8, 29
45 Hatchet-handle	3, 2, 24, 31, 6, 35, 8, 18, 29
46 Fisherman's reel	1, 8, 3, 1, 23, 27, 21, 18, 29
47 Small hand-cart	3, 34, 7, 7, 2, 37, 35, 5, 14, 26, 18, 29, 23
48 Salt-box	3, 7, 6, 37, 35, 5, 1, 23, 18, 8, 22, 25
49 Egg-rack, or wash-tub (*porte-senfs on Cuvier*)	3, 7, 6, 37, 27, 21, 35, 8, 14, 17
50 Board for cutting bread (form of fish)	3, 1, 6, 31, 14, 18, 35, 7, 6, 23, 41, 29

MODELS.	TOOLS EMPLOYED IN MAKING EACH OBJECT. The numbers correspond to those of 1st column, Table I.
51 Match-box with lid	3, 6, 37, 35, 51, 14, 26, 18, 29, 23
52 Match-box with friction	3, 6, 37, 35, 1, 23, 18, 21, 5, 35, 8, 17, 29, 25
53 Box with friction	3, 6, 37, 35, 1, 23, 21, 18, 21, 5, 27, 14, 25, 16
54 Pegs	3, 1, 2, 6, 8, 31, 23, 18, 27, 21, 35, 14, 29
55 Beetle, for linen, fastened on pin	See Model No. 34, and add 24 and 19.
56 Skimmer	3, 34, 7, 1, 14, 16, 31, 23, 26, 32, 29, 2, 24, 18
57 Boot-jack	3, 7, 6, 37, 35, 21, 2, 1, 31, 23, 18, 8, 14, 5, 29
58 Fish-spoon (grooved handle)	3, 34, 7, 6, 1, 14, 16, 32, 30, 3, 23, 31, 21, 18, 9
59 Covered box (two compartments)	3, 7, 6, 37, 35, 5, 14, 26, 37, 8, 21, 1, 23, 18, 2
60 Pen-box, for school use	3, 6, 37, 35, 5, 23, 14, 8, 26, 33, 29
61 Knife-box	3, 7, 6, 37, 35, 25, 1, 23, 18, 5, 14, 26, 8, 29
62 Box for dish-washer	3, 7, 6, 37, 35, 23, 1, 18, 5, 14, 26, 8, 25, 29
63 Scraper	3, 7, 6, 37, 35, 27, 14, 8, 25
64 Stool	3, 7, 6, 37, 35, 8, 36, 27, 21, 2, 23, 18, 14, 5, 4, 1, 25, 29
65 Salt-box	3, 7, 6, 37, 35, 5, 1, 23, 18, 5, 14, 26, 8, 21, 1, 33, 12, 25
66 Carpenter's square	3, 6, 37, 35, 14, 5, 8, 29
67 Carpenter's square, 4.50	3, 6, 37, 35, 14, 5, 8, 29
68 Beam-compass	3, 6, 37, 35, 27, 22, 15, 26, 14, 1, 16, 18, 29, 23
69 Picture-frame	See Model No. 12 and No. 48.
70 Spoon for skimming cream (clasped)	3, 6, 37, 35, 5, 14, 23, 27, 8
71 Oval bread-board	3, 6, 2, 7, 6, 35, 8, 31, 17, 29
72 Large pot-spoon	3, 34, 7, 3, 1, 14, 2, 8, 14, 16, 32, 29, 21, 23
73 Carved bread-board	3, 2, 6, 35, 7, 31, 14, 23, 18, 29
74 Meat-beater	3, 6, 37, 35, 8, 14, 18, 21, 29
75 Carved bread-board	See Model No. 73, and add tools 23 and 14.
76 Water-bucket	3. 1. 6. 8. 14. 16. 17. 29. 2. 23. 18
77 Décimètre cube	3. 7. 6. 37. 35. 5. 14. 27. 8. 23. 21. 29
78 *Pegs	3. 7. 6. 37. 35. 5. 8. 27. 21. 23. 18. 34. 25
79 Rolling-pin	See Model No. 43; add 21. 37. 27. 5. 14. 18
80 Spoon for scullion (large size)	See Model No. 72, and add tools 5 and 21.
81 Large box for soft soap	3. 7. 6. 8. 37. 27. 14. 21. 16. 18. 29. 36. 2
82 *Swedish coffee-mill	3. 7. 6. 37. 35. 14. 26. 17. 29. 8
83 Foot-stool with slanting feet	3. 7. 6. 37. 35. 8. 27. 1. 23. 14. 18. 5. 29
84 Drawing-board	3. 7. 6. 37. 35. 23. 5. 14. 36. 8. 29
85 Box with compass (hinged cover)	3. 7. 6. 37. 35. 5. 14. 26. 8. 32. 25. 18. 29
86 Box with sliding cover	3. 7. 6. 37. 35. 5. 14. 26. 8. 23. 33. 29
87 Mason's level	3. 7. 6. 37. 35. 5. 15. 26. 25. 21. 27. 1. 18. 36. 29
88 Folding chair	See Model No. 43; add tools 27. 21. 25. 23
89 Spittoon	3. 7. 6. 37. 35. 36, 5. 8. 14. 25. 1. 16. 18. 29
90 *Butter-print	See Model No. 89; add tools 23 and 21.
91 T-Rule	3. 6. 37. 35. See Model No. 10.
92 Kneading-trough	See Model No. 89, and add tools 21. 23. 31.
93 Chopping-tray	3. 7. 6. 37. 35. 5. 14. 26. 23. 8. 18. 29. 25
94 Tap (or plug)	See Model No. 27 plus tools 14. 23. 18. 29.
95 Waste-box	See Model No. 89.
96 Étagère	3. 7. 6. 37. 35. 5. 23. 14. 27. 1. 31. 18. 29
97 Foot-stool	3. 7. 6. 35. 37. 27. 21. 4. 23. 18. 26. 5. 1. 29
98 Large reel	3. 7. 6. 37. 35. 15. 14. 5. 1. 18. 8. 27. 23. 21. 29
99 Chair	3. 7. 6. 37. 35. 15. 5. 1. 23. 8. 21. 18. 29
100 Bucket with handle	3. 34. 7. 6. 35. 27. 1. 36. 23. 14. 12. 18. 16. 32. 29

Journal of Education

WEEKLY, $2.50 A YEAR

:o:

SPECIALLY ADAPTED TO THE NEEDS OF

Teachers, Superintendents, Commissioners and School Committee.

A. E. WINSHIP, - - - Editor.

Among its numerous contributors are many of the ablest educators in the country.

It has a large amount of every-day, practical matter for teachers of all grades.

Its departments cover every branch of educational work.

It gives its readers the greatest variety of the best in

Fact, Philosophy, Methods, Poetry, Literary Criticism, Travel, Science, Art, Reports of Educational Meetings, News, etc.

Should be taken by every Professor, Teacher and friend of Education throughout the country.

TRIAL OFFER.

For the small sum of **50 cents** we will send you the **Journal** for

THREE MONTHS.

SAMPLE COPIES FREE.

TEACHERS' HELP MANUALS.

"*They are the best School-room Aids I have ever used,*" is the almost universal testimony.

No. 1. Practical Grammar—500 Exercises.
No. 2. Manual of Correspondence.
No. 3. Mechanics' Arithmetic.
No. 4. Easy Problems for Young Thinkers.
No. 5. Catch Questions in Arithmetic.
No. 6. One Hundred Lessons in Composition. By W. H. HUSTON.

Price 25 cents each, or 5 for $1.00.

NEW ENGLAND PUBLISHING COMPANY,

3 Somerset St., Boston, Mass. 106 Wabash Ave., Chicago.

✻FOR 1889✻

AMERICA ✻ ✻ ✻

* * * * **A Journal for Americans**

Has already secured contributions from the following distinguished list of writers:

ADMIRAL PORTER,
FRANCIS L. PATTON,
WASHINGTON GLADDEN,
MAURICE THOMPSON,
HERBERT TUTTLE,
FREDERICK SCHWATKA,
ALBION W. TOURGEE,
ANNA LAURENS DAWES,
H. H. BOYESEN,
ANNA FARWELL DE KOVEN,
BRET HARTE,
W. CLARK RUSSELL,
ANDREW LANG,
J. T. TROWBRIDGE,
BRANDER MATTHEWS,
EDGAR FAWCETT,
EUGENE FIELD,
MRS. BURTON HARRISON,
FRANCIS COURTENAY BAYLOR,
AND OTHERS.

It gives each week the Contents of a Monthly for the price of a Weekly.

Terms, $3.50 a Year; $2.00 for Six Months; $1 for Three Months,
Payable in Advance.
Published every Thursday at 180 Monroe Street, Chicago.

KINDERGARTEN AND SCHOOL SUPPLIES } J. W. Schermerhorn & Co. 7 East 14th St., New York.

GUSTAV E. STECHERT,

—IMPORTER OF—

Foreign Books and Periodicals,

828 BROADWAY, NEW YORK.

Catalogues of Second-hand Books will be sent gratis on application. | English, French and German Monthly Bulletins of New Books.

BRANCHES: {Leipzig, Hospital Strasse 10. {London, 26, King William St., Strand, W. C.

E. G. Soltmann | **DRAWING MATERIALS** | 119 Fulton Street, NEW YORK.

WOMAN'S EXCHANGE.

TEACHERS' BUREAU (For both Sexes).

Supplies Professors, Teachers, Governesses, Musicians, etc., to Colleges, Schools, Families and Churches, also Bookkeepers, Stenographers, Copyists and Cashiers to Business Firms.

Address, MRS. A. D. CULVER, 329 Fifth Avenue, New York.

The Baker & Taylor Co.

740-742 Broadway, New York,

make a SPECIALTY of supplying

SCHOOL AND COLLEGE TEXT BOOKS

at the LOWEST RATES.

Publications of all the American Houses always in stock. Send for our General School Book Catalogue with net and retail prices, and telegraphic code.

FOR ALL PUBLICATIONS ON **Manual Training**

Address Registrar of * * *

* * College for the Training of Teachers

9 University Place, N. Y.

STUDENTS ✳ ✳

Desiring to enter the

✳ College for the Training of Teachers

in the Autumn of 1889, should make application *now*, if aid is desired from the Scholarship Fund. Address, giving all particulars,

NICHOLAS MURRAY BUTLER, Ph.D.,

President,

9 University Place, New York City.

HAMMACHER, SCHLEMMER & CO.

Cabinet and Piano Hardware,

209 BOWERY, - - - NEW YORK.

Carry THE LARGEST ASSORTMENT of

FINE MECHANICS' TOOLS

in this country.

NEW TOOL CATALOGUE, nearly 200 pages, just ready, will be sent prepaid on application.

Have you a Cyclopedia?

If not you want one and **Alden's Manifold** is just the one. If you have one you also want the **Manifold** to supplement it.

Alden's Manifold Cyclopedia of Knowledge and Language is publishing in 30 or more volumes, with thousands of Illustrations, Ideal Edition, about 640 pages each, Brevier type. Price per vol., cloth. **50c.** (20c.); half Morocco, marbled edges, **65c.** (25c.); 22 oz. A specimen volume may be ordered and returned if not wanted. Vol. 14 *ready*; volumes issued at intervals of about one month.

Price of the set of 30 vols., cloth, for cash received before April 1, 1889, **$11.25.** For half Morocco, add 15 cents a volume. **Free** an extra copy for a club of five subscribers.

The most convenient Cyclopedia to use. Remarkably comprehensive. Brought down to the latest period. Subjects treated by experts in their several lines. Carefully edited. Fully illustrated. Nicely printed and bound. Invaluable to the professional man and everybody else who reads. A Cyclopedia of knowledge, gazeteer, and dictionary combined. The very best Cyclopedia for schools and home use. Highest value; lowest price.

"It is a real merit of Alden's Cyclopedia that size of the volumes makes use convenient. Then there is a consideration, by no means unimportant, in the low price. Still, these merits, convenient size and cheapness, would not be worth consideration if the matter were lacking, or if treatment of subjects were faulty. In these respects the Manifold Cyclopedia compares favorably with similar works that cost ten times as much. It is, in fact, exceptionally full in treatment of many subjects that have in more pretentious works only hasty notice."—*The Husbandman*, Elmira.

"The more we see of this work the better we are pleased with it. It is filling a field in the scheme of dissemination and popularization of knowledge that no other book-work has entered. The 'Manifold' is invaluable both as a reference series, a pronouncing gazetteer and a dictionary. How Alden can issue so thoroughly well prepared and handsomely illustrated a work at 50 cents per volume is a riddle."—*Record-Union*, Sacramento.

Famous Writers and their Work.

Alden's Cyclopedia of Universal Literature is publishing in volumes of about 500 pages each, Ideal Edition, large type. It will be completed in not less than 15 or more than 20 volumes, issued at short intervals. Price per volume, cloth, gilt top, **50c.** (20c.); half Morocco, **60c.** (25c.); 18 oz. A specimen volume may be ordered and returned if not wanted. *Thirteen volumes ready.*

Price of the set of 15 vols., cloth, for cash received before April 1, 1889, **$6.00.** For half Morocco, add 10 cents a volume. **Free,** an extra copy for a club of five subscribers.

"Alden's Cyclopedia of Universal Literature is a work which grows upon us with each volume issued. Its plan is to cover the literature of all languages and all ages. What is most interesting in the lives and literary careers of the authors is embodied in a concise sketch; and what is more unique, if not before absolutely unattempted, is to give a sample of the writings of the author or literary character under consideration. This is valuable for any person who desires for any purpose to consult such a work, it is particularly important for the student who is intent upon a thorough knowledge of his subject. There is a delicate and yet distinct depicting of oneself in what one writes—a natural literary photography, so to speak, that no analysis by any biographer can attain to. This feature of the work makes it of especial value to any person who does not possess a large library. It is, in fact, a library in itself. One could be profitably employed for months and even for years, in taking up the orators, poets, statesmen, philosophers and literateurs of all ages and countries, presented on these rich pages. Of course what is given may be taken and generally ought to be taken, as merely the threshold upon which one takes the first step. He sees enough from that standpoint to lure him to seek for more. In examining the volumes already received, we are surprised at the wide range of the work, at its interesting character, and its general completeness."—*Farm, Field and Stockman*, Chicago.

JOHN B. ALDEN, PUBLISHER,

New York, Chicago, Atlanta & San Francisco.

The Prang Course of Instruction in Form and Drawing.

This course is the outgrowth of fifteen years' experience devoted to the development of this single Subject in public education, under the widest and most varied conditions.

It differs widely from all the so-called "Systems of Drawing" before the public.

The aim or object of the instruction is different.

The Methods of teaching and the Work of pupils are different.

The Models, Text-books, and materials are on an entirely different Educational plan.

The results in Schools are widely and radically different.

It is the only Course based on the use of Models and Objects and for which Models have been prepared.

The Course prepares directly for MANUAL TRAINING. Many of the exercises are in themselves elementary exercises in MANUAL TRAINING.

THE PRANG COURSE has a much wider adoption in the best schools of the country than all the "Systems of Drawing" put together.

More than *two millions* of children in public schools are being taught FORM AND DRAWING by THE PRANG COURSE.

PRANG'S NORMAL DRAWING CLASSES.

These classes have been established for giving the very best kind of instruction in Drawing through home study and by correspondence. All teachers can, through these classes, prepare themselves to teach Drawing in their schools.

☞Send for Circulars in regard to PRANG'S COURSE OF INSTRUCTION IN FORM STUDY AND DRAWING, and also in regard to PRANG'S NORMAL DRAWING CLASSES. Address,

THE PRANG EDUCATIONAL COMPANY,

BOSTON.

Mathushek

PIANOS.

Before purchasing so important an article as a piano-forte, will it not be prudent for you to examine into the many merits of the **Mathushek?** It is not new; the company has been successfully in operation twenty-two years.

Nineteen Thousand Mathushek Pianos are giving constant satisfaction, and they are their own most successful advertising medium. The tone and action of the **Mathushek** are unexcelled, and their extreme durability is freely acknowledged by dealers and tuners throughout the country. The great resources, facilities and experience of the company, together with the large number of skilled workmen (many of whom have been with them over twenty years), enable them to produce an instrument that, as a whole, is unequalled. ALL PARTS, INCLUDING CASES, ACTIONS, IRON PLATES, SOUNDING-BOARDS, etc., are made by themselves in their own factory.

Catalogue, with illustrations of TWENTY different styles, *sent free* on application.

The Mathushek Piano Mfg. Co.,

NEW HAVEN, CONN.

NEW YORK WAREROOMS: No. 80 Fifth Ave., 2d door below 14th St.

UNIVERSITY OF CALIFORNIA LIBRARY,
BERKELEY

THIS BOOK IS DUE ON THE LAST DATE
STAMPED BELOW

Books not returned on time are subject to a fine of 50c per volume after the third day overdue, increasing to $1.00 per volume after the sixth day. Books not in demand may be renewed if application is made before expiration of loan period.

SEP 5 1921

20m-11,'20

PHITES

x-brain and
t.

emedy with
al diseases.
the mental,
so well de-
nd assures
or the cure
pepsia and
hended by
k Hopkins,
arck, Glad-
n-workers.
Phosphate.
mail, $1.

E,

usness,
ll

This ... preparation of the phosphates and phos ... required by the system.

It aids digestion without injury, and is a beneficial food and tonic for the brain and nerves.

It makes a delicious drink with water and sugar only, and agrees with such stimulants as are necessary to take.

Descriptive pamphlet free.

Rumford Chemical Works, Providence, R. I.

BEWARE OF SUBSTITUTES AND IMITATIONS.

CAUTION.—Be sure the word "HORSFORD'S" is printed on the label.

All others are spurious. Never sold in bulk.

U.C. BERKELEY LIBRARIES
C006096604

RETURN TO the circulation desk of any
University of California Library
or to the
NORTHERN REGIONAL LIBRARY FACILITY
Bldg. 400, Richmond Field Station
University of California
Richmond, CA 94804-4698

ALL BOOKS MAY BE RECALLED AFTER 7 DAYS
2-month loans may be renewed by calling
(510) 642-6753
1-year loans may be recharged by bringing books to NRLF
Renewals and recharges may be made 4 days prior to due date

DUE AS STAMPED BELOW

MAY 23 1996

20,000 (4/94)